WHAT IS CLAIMED IS:

1. A worktable device for a semiconductor process, comprising:

a worktable having a main surface for supporting a target substrate and a sub-surface disposed around said main surface;

a cooling mechanism disposed in said worktable and configured to supply cold to the main surface and the sub-surface;

a focus ring placed on the sub-surface and configured to surround the target substrate on the main surface; and

a heat transfer medium interposed between the sub-surface and said focus ring, said heat transfer medium being so disposed as to improve thermal conductivity between the sub-surface and said focus ring to be higher than in a case with no thermal transfer medium.

2. The device according to claim 1, wherein said heat transfer medium consists essentially of a solid material selected from the group consisting of a metal, ceramic material, carbon-derivative material, and heat-resistant elastic member.

3. The device according to claim 2, wherein said heat transfer medium consists essentially of the heat-resistant elastic member selected from the group consisting of conductive silicone rubber and conductive

fluororubber.

4. The device according to claim 2, wherein said heat transfer medium is adhered to the sub-surface with a heat transfer adhesive.

5. The device according to claim 1, wherein said heat transfer medium consists essentially of a heat transfer medium gas, and said apparatus further comprises a gas passage, formed in said worktable, in order to supply the heat transfer medium gas between the sub-surface and said focus ring.

6. The device according to claim 5, wherein said heat transfer medium consists essentially of a gas containing part of a composition of an inert gas or a process gas to be supplied around said worktable.

7. The device according to claim 1, wherein said focus ring consists essentially of a conductive material, and said heat transfer medium consists essentially of a conductive material.

8. The device according to claim 1, further comprising a press mechanism configured to press said focus ring against the sub-surface.

9. The device according to claim 8, wherein said press mechanism comprises a clamp frame having a contact portion which comes into contact with said focus ring from above, and an extending portion extending downward from the contact portion along a side portion of said worktable.

10. The device according to claim 9, wherein said clamp frame is fixed to said worktable with a fixing member.

11. The device according to claim 9, wherein said clamp frame consists essentially of a material selected from the group consisting of an alumina ceramic material, an aluminum-free ceramic material, and an engineering plastic.

12. The device according to claim 9, further comprising an outer cover substantially made of a heat-resistant synthetic resin and configured to cover said clamp frame.

13. The device according to claim 1, further comprising an electrostatic chuck disposed on the main surface and configured to fix the target substrate, and a gas passage formed in said worktable and configured to supply a heat transfer medium gas between said electrostatic chuck and the target substrate.

14. A plasma processing apparatus for a semiconductor process, comprising:

a hermetic process chamber;

a supply system configured to supply a process gas into said process chamber;

an exhaust system configured to vacuum-evacuate an interior of said process chamber;

an excitation mechanism configured to excite and plasmatize the process gas;

a worktable disposed in said process chamber and having a main surface for supporting a target substrate and a sub-surface disposed around the main surface;

a cooling mechanism disposed in said worktable and configured to supply cold to the main surface and the sub-surface;

a focus ring placed on the sub-surface and configured to surround the target substrate on the main surface; and

a heat transfer medium interposed between the sub-surface and said focus ring, said heat transfer medium being disposed so as to improve thermal conductivity between the sub-surface and said focus ring to be higher than in a case with no thermal transfer medium.

15. The apparatus according to claim 14, wherein said heat transfer medium consists essentially of a solid material selected from the group consisting of a metal, ceramic material, carbon-derivative material, and heat-resistant elastic member.

16. The apparatus according to claim 15, wherein said focus ring consists essentially of a conductive material, and said heat transfer medium consists essentially of a conductive material.

17. The apparatus according to claim 14, wherein said heat transfer medium consists essentially of a heat transfer medium gas, and said apparatus further

comprises a gas passage, formed in said worktable, in order to supply the heat transfer medium gas between the sub-surface and the focus ring.

18. The apparatus according to claim 14, further comprising a press mechanism configured to press said focus ring against the sub-surface.

19. The apparatus according to claim 18, wherein said press mechanism comprises a clamp frame having a contact portion which comes into contact with said focus ring from above, and an extending portion extending downward from the contact portion along a side portion of said worktable.

20. The apparatus according to claim 14, further comprising an electrostatic chuck disposed on the main surface and configured to fix the target substrate, and a gas passage formed in said worktable and configured to supply a heat transfer medium gas between said electrostatic chuck and the target substrate.